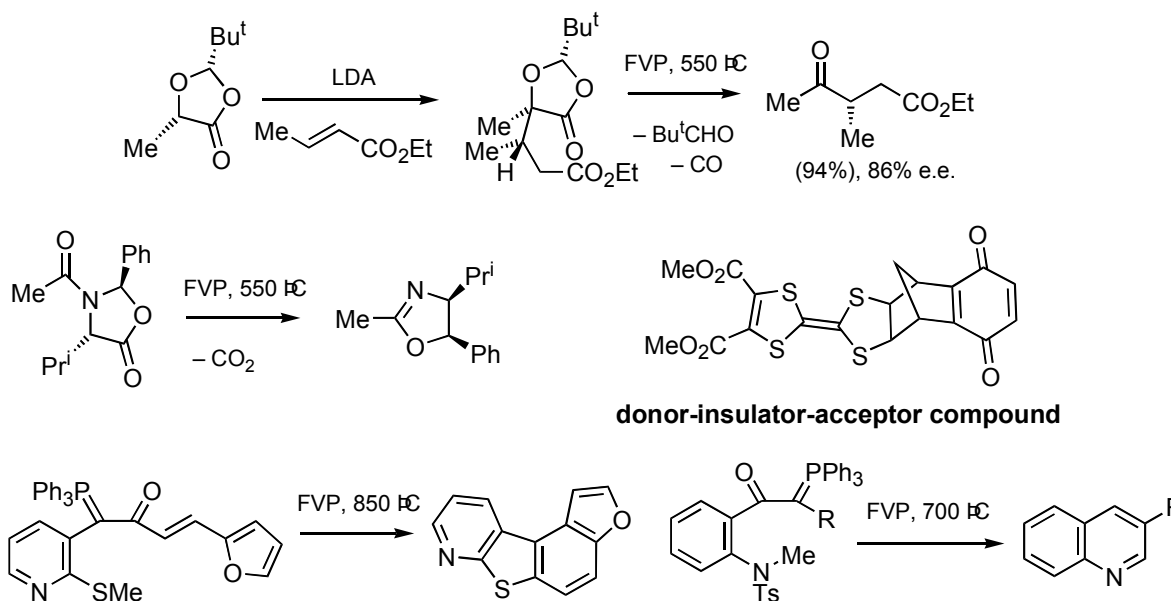




Research Interests: synthetic chemistry, asymmetric synthesis, flash vacuum pyrolysis, heterocyclic chemistry, electronic materials, organophosphorus chemistry

Our major interest lies in the discovery of new reactions and their application to synthesis and to the formation of new types of compound. In many cases mechanistic studies are required to elucidate the course of the reactions and, as well as the properties and reactivity of the novel compounds being of interest, many have potential applications for example as anti-tumour agents, selective enzyme inhibitors and new electronic materials.



Gas-phase cascade reactions leading to direct construction of new polycyclic heterocyclic ring systems have been discovered. A major study is directed towards formation of new sulfur-rich heterocycles and heterocyclic polymers of interest as organic conductors and non-linear optical materials. Novel reactions of the dihydrotetrathiafulvalene type structures are also being examined and related sulfur-rich polymers are effective in sequestering heavy metals from waste water streams. As one of the few UK research groups active in the important area of organophosphorus chemistry, we are examining the synthesis, structure and reactivity of a variety of unusual compound types with potential applications as pH indicators and sensors.

SELECTED RECENT PUBLICATIONS

- Flash vacuum pyrolysis of stabilised phosphorus ylides. Part 17. Preparation of aliphatic amino acid derived γ -alkoxycarbonylamino- β -oxo ylides and pyrolysis to give α , β -acetylenic- γ -amino acid and GABA analogues. R.A. Aitken, N. Karodia, T. Massil, R.J. Young *J. Chem. Soc., Perkin Trans. 1* **2002**, 533-541..
- Synthesis and Pyrolytic and Kinetic Behaviour of β , γ '-Dioxo Stabilised Phosphorus Ylides: Convenient Preparation of γ , δ -Alkynylketones and 2,3-Functionalised Butadienes. R.A. Aitken, N.A. Al-Awadi, M.E. Balkovich, H.J. Bestmann, O. Clem, S. Gibson, A. Groß, A. Kumar, Th. Röder, *Eur. J. Org. Chem.* **2003**, 840-847.
- A New Crystalline Zwitterionic Product from Reaction of Bu_3P and DMAD. R.A. Aitken, S.J. Costello, A.M.Z. Slawin, N.J. Wilson *Eur. J. Org. Chem.* **2003**, 623-625.
- Synthesis, thermal reactivity and kinetics of substituted [(benzoyl) (phenylcarbamoyl)methylene]triphenyl phosphoranes and their thiocarbamoyl analogues. R.A. Aitken, N.A. Al-Awadi, G. Dawson, O. El-Dusouqi, D.M.M. Farrell, K. Kaul, A. Kumar *Tetrahedron* **2005**, 61, 129-135.
- High-resolution infrared and theoretical study of gaseous 1,2,5-selenadiazole in the $600\text{-}1400\text{ cm}^{-1}$ range. F. Hegelund, R. Wugt Larsen, R.A. Aitken, M.H. Palmer *J. Mol. Spectrosc.* **2006**, 236, 189-200.